A Presentation to the
SRS Citizens Advisory Board

SRS Sitewide Groundwater Remediation Progress

Chris Bergren, Project Manager

Area Completion Projects

Savannah River Nuclear Solutions, LLC

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Acronyms

ABRP	A-Burning Rubble Pile
CMP	Chemicals, Metals, Pesticides
DNAPL	Dense Non-Aqueous Phase Liquid
DUS	Dynamic Underground Stripping
FY	Fiscal Year
LLAZ	Lost Lake Aquifer Zone
MCB	Metals, Chemicals Basin
SRS	Savannah River Site
SVE	Soil Vapor Extraction
TCE	Trichloroethylene
Ug/L	Micrograms per liter

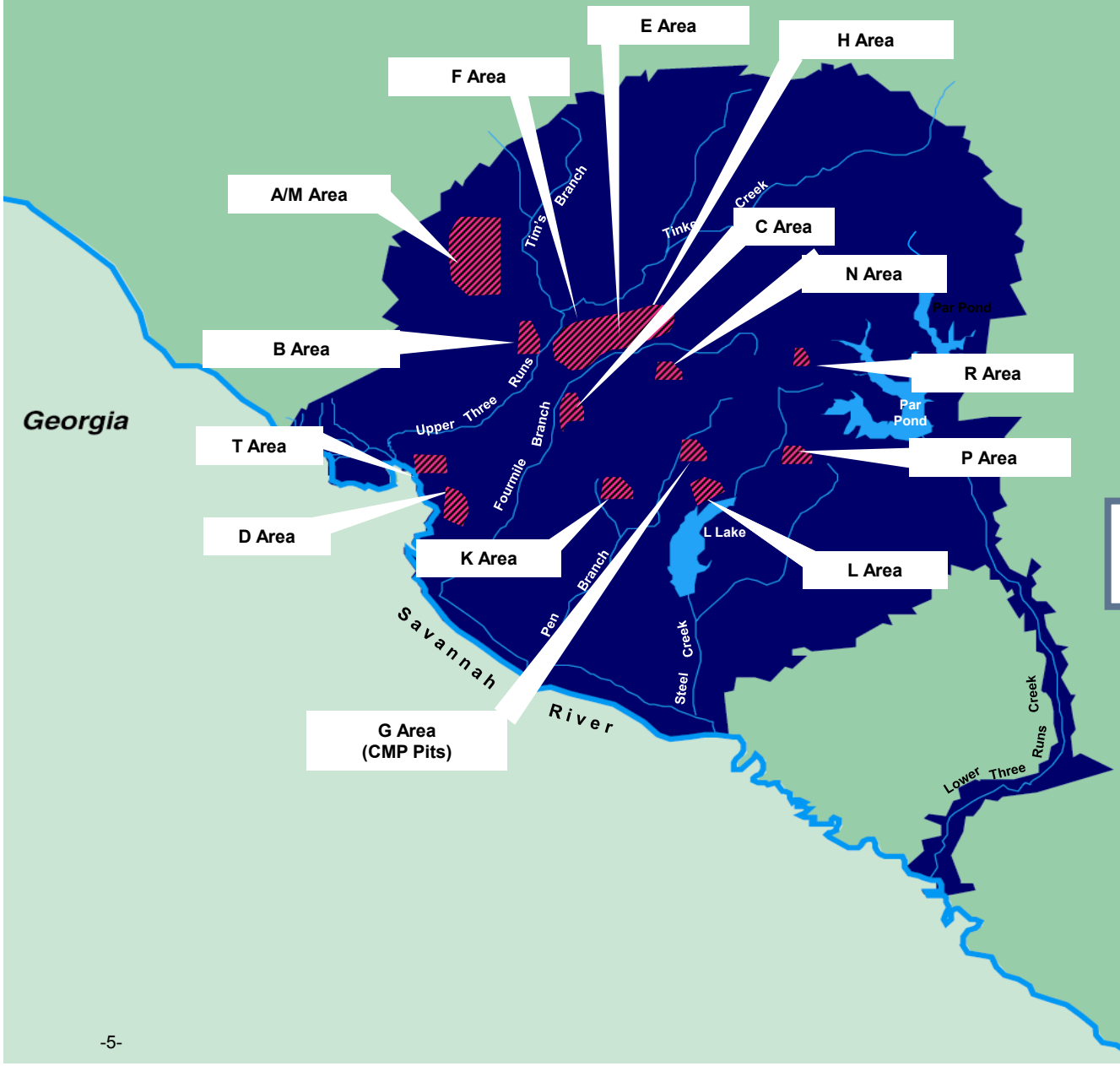
Purpose

To status progress of groundwater remediation at the Savannah River Site

Agenda

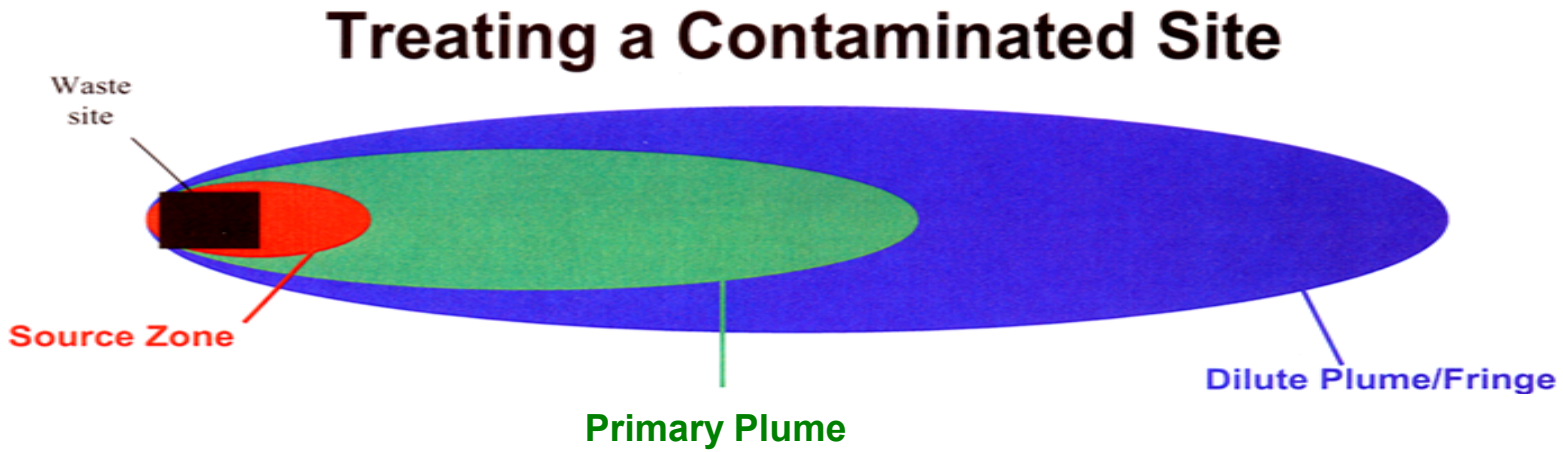
- Groundwater Contamination Areas at SRS
- Remediation Strategies
- Status
- Conclusion

Savannah River Site
Groundwater Contamination Areas



- **14 Groundwater Contamination Areas**

Remediation Strategy



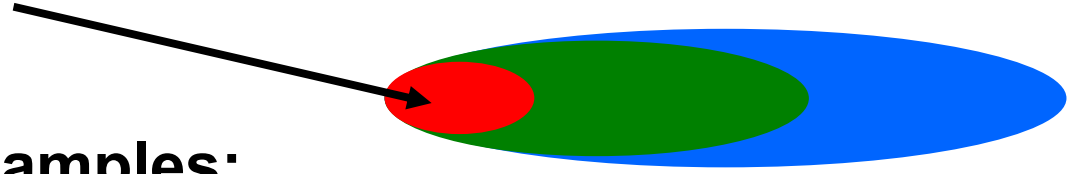
Active Remediation — Enhanced Natural Remediation — Passive Monitored Natural Attenuation

High cost → Low Cost

Status Overview

- Much progress has been made in groundwater remediation at SRS
  - Contaminants are being addressed in 12 of 14 groundwater contamination areas:
    - Active remediation continues in 1 area
      - A/M Area
    - Enhanced natural remediation in 5 areas
      - F Area
      - E Area
      - H Area
      - T Area
      - P Area (Passive at P-Burning Rubble Pit)
    - Passive natural remediation in 6 areas
      - L Area
      - G Area
      - B Area
      - R Area
      - C Area
      - D Area
  - Two groundwater contamination areas remain to be completely characterized
      - N- Area
      - K-Area (Passive at K-Burning Rubble Pit)

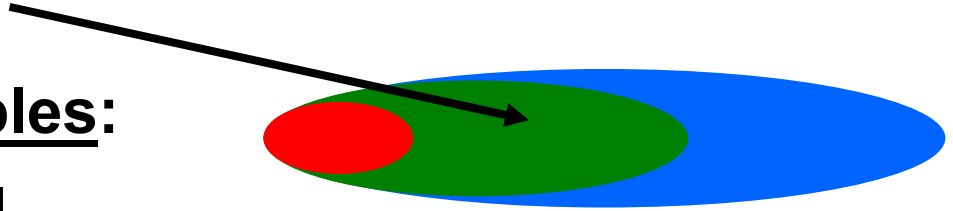
Source Zone



Remediation Examples:

- Excavation
- Low permeability covers
- Thermal technologies
- In-situ chemical oxidation
- Soil vapor extraction (SVE)

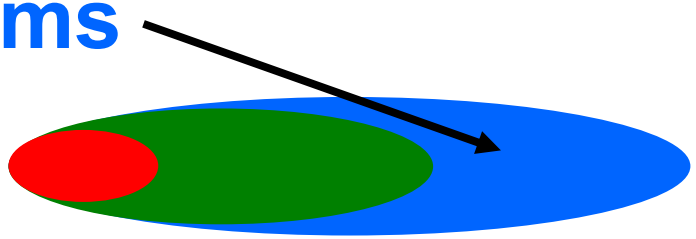
Primary Plume



Remediation Examples:

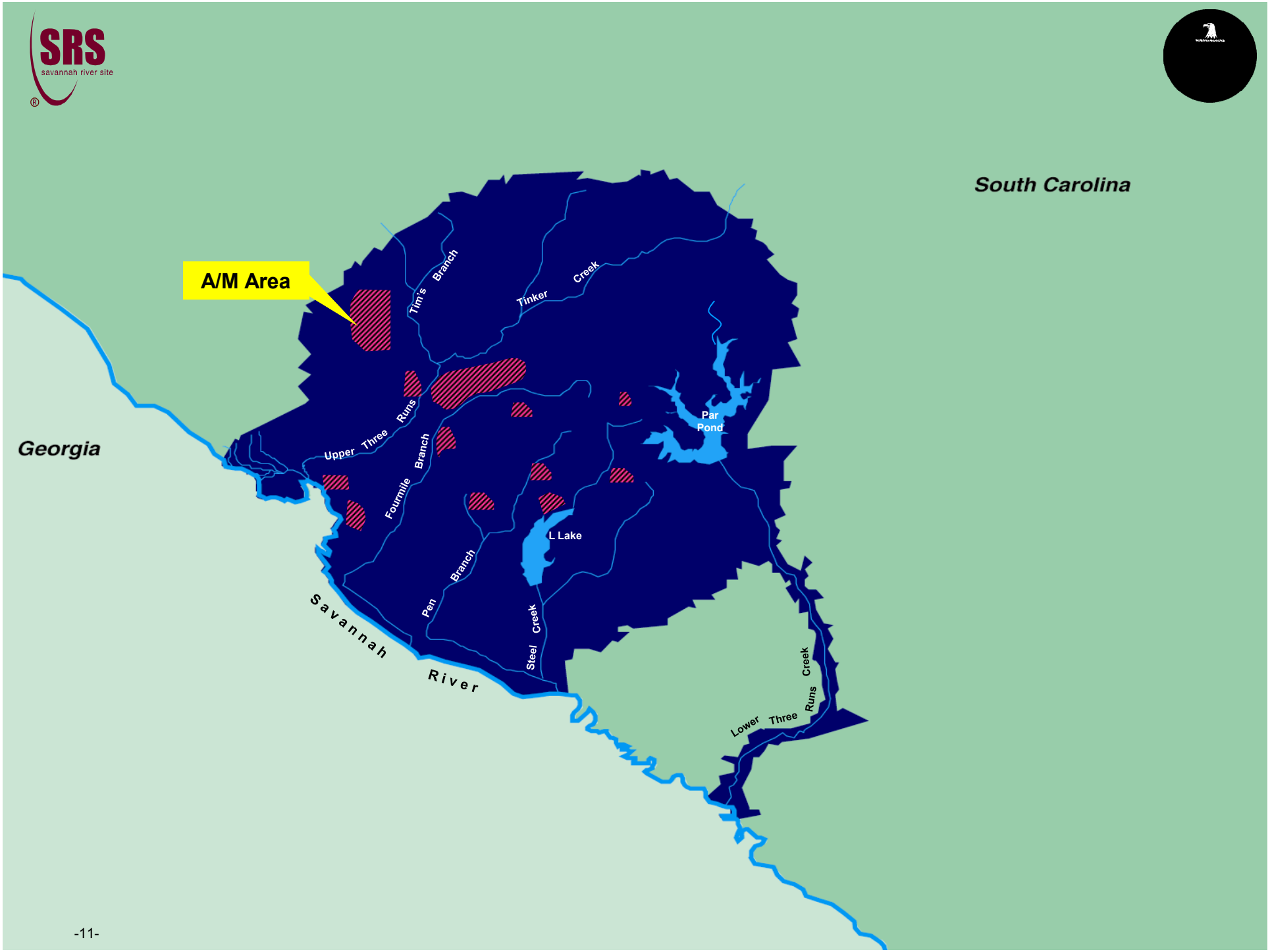
- **Hydraulic Control**
  - Pump and Treat
  - Phytoremediation pond
  - Barrier walls
- **In situ**
  - Airlift recirculation wells
  - Base injection
  - Chemical oxidation injection
  - Nutrient injection to enhance bioremediation

Passive Natural Systems



<u>Remediation Examples</u>:

- **Phytoremediation**
- **Monitored Natural Attenuation**

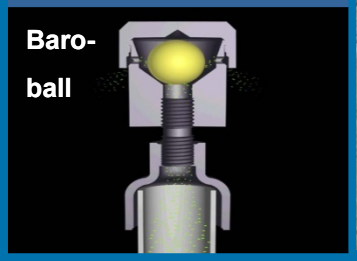

SRS
savannah river site
South Carolina
Georgia
A/M Area
Tim's Branch
Tinker Creek
Upper Three Runs
Fourmile Branch
Par Pond
L Lake
Pen Branch
Steel Creek
Savannah River
Lower Three Runs Creek


30' Soil Borings at Process Sewer Tie-In

M-Area


A-2 Airstripper


M Area Passive Soil Vapor Extraction Piping of Treatment Cell #1

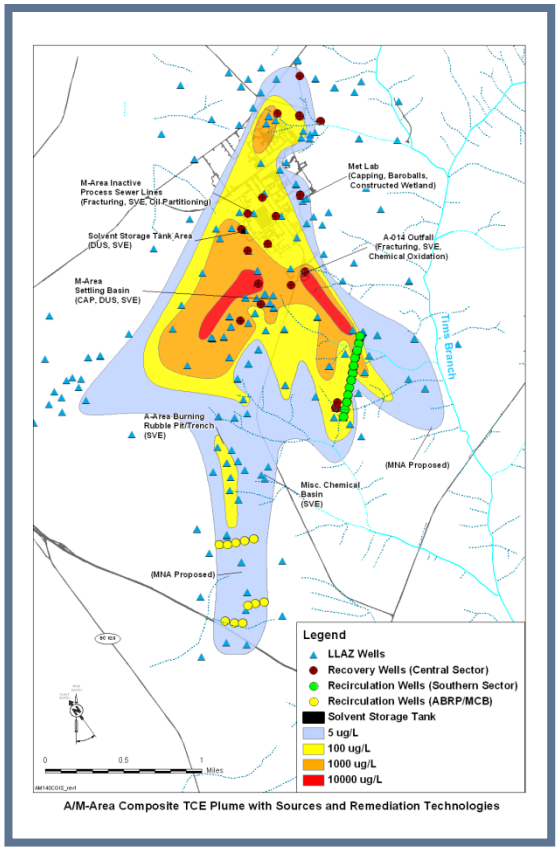



Completed Passive Soil Vapor Extraction Well Heads

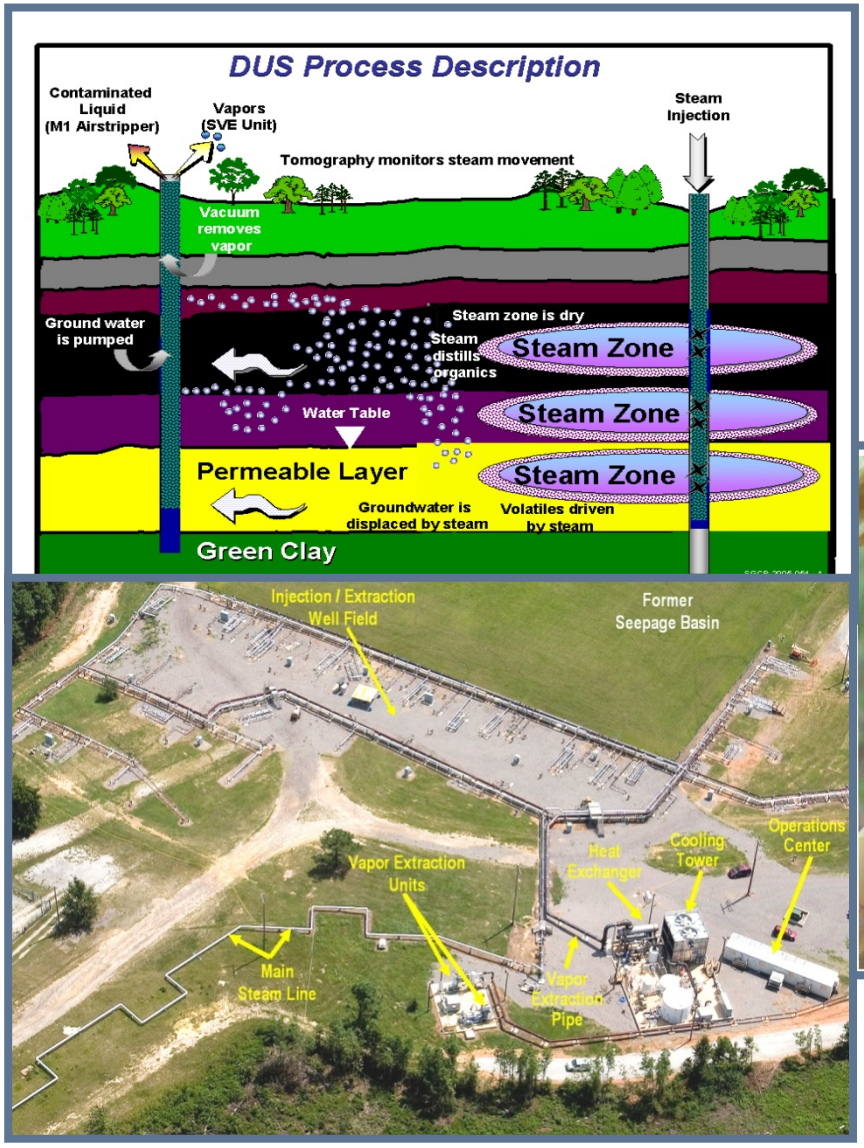
Employees guide the lift liners into roll-off pans for shipment to Clean Harbors Lone Mountain Facility in Oklahoma

M-Area Completion Celebration

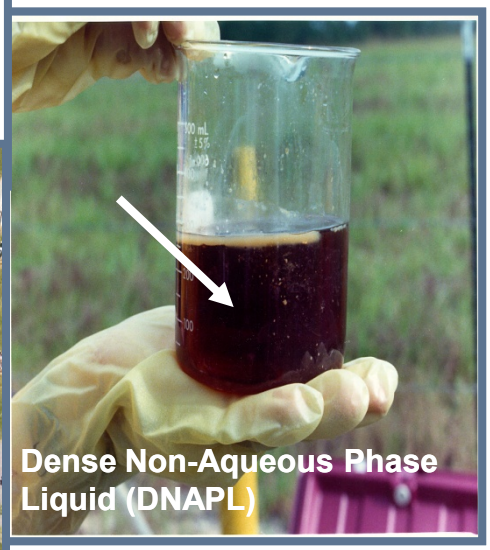
A/M Area



A/M-Area Composite TCE Plume with Sources and Remediation Technologies



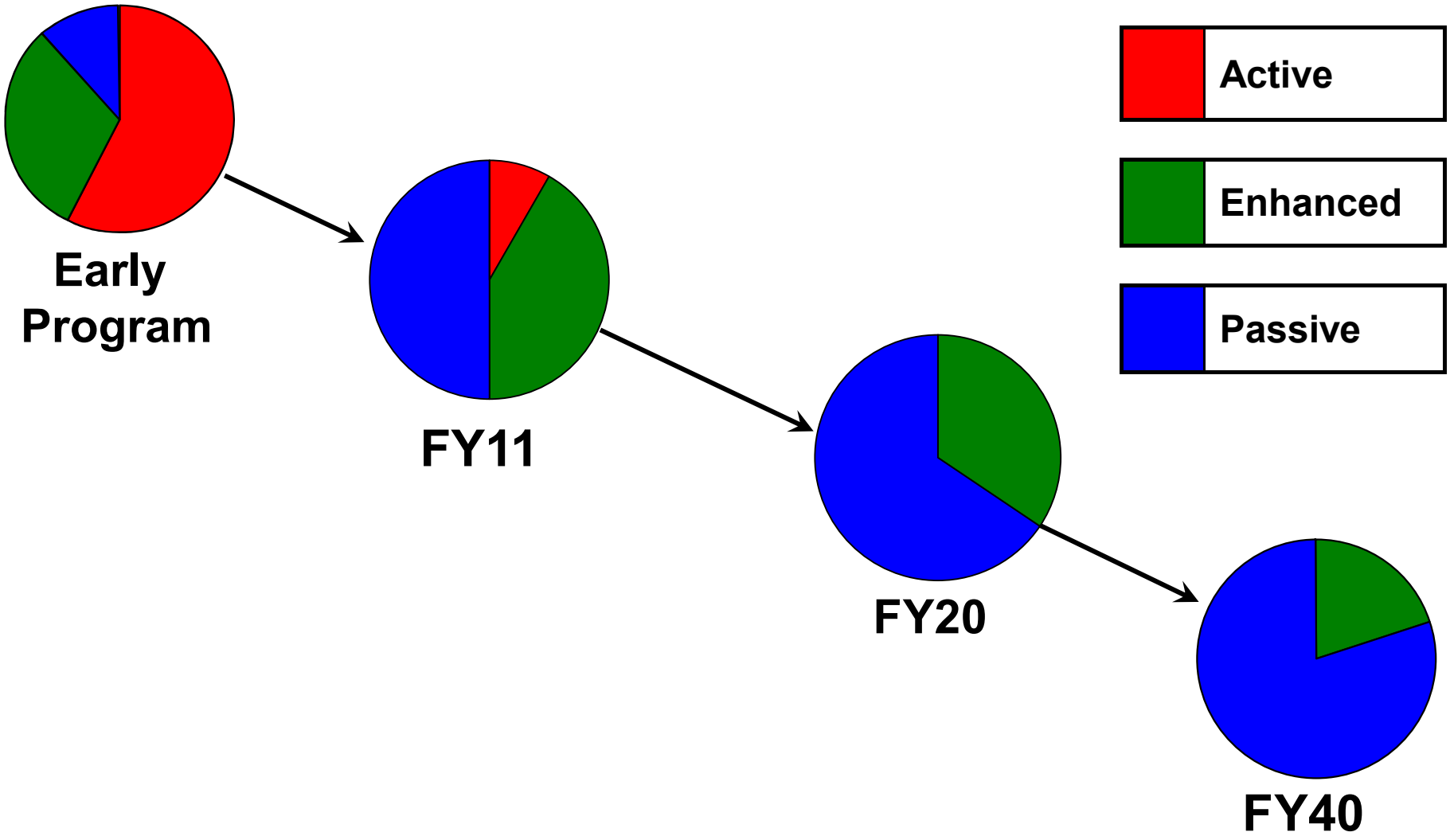
Dynamic Underground Stripping



A/M Areas
Solvents

- **Source Control**
  - **Excavated contaminated soil**
  - **Capped basins**
  - **Dynamic Underground Stripping removed high concentration solvents**
  - **Using Chemical Oxidation to remove small pockets of high concentration solvents**
  - **Using Soil Vapor Extraction to remove residual solvents**
- **Primary plume**
  - **Using Pump-and-Treat with Airstripping for hydraulic control**
  - **Using Airlift Recirculation Wells to remove contaminants**
- **Depleted sources**
  - **Using passive Soil Vapor Extraction (baroballs)**
  - **Using Solar Powered Soil Vapor Extraction**

SRS Groundwater Program
Active to Passive



Summary Data for SRS Groundwater Contamination Areas

Risk (Based on Extent of Contamination)	GW Contamination Area	~% of GW Remediated (Based on Level of Effort [LOE] to Remediate)	GW Fully Characterized (Y/N)	Reason	Source(s) Remain (Y/N)	Source ID
1	A/M	40	N	Western Sector Not Complete	Y	Vadose Zone
2	E	65	Y	--	N	--
3	F	50	Y	--	Y	F-Inactive Process Sewer Lines
4	H	50	Y	--	N	--
5	D	0**	N (15% LOE remains)	Federal Facilities Agreement (FFA) Schedule	Y	Low pH Conditions
6	C	0**	N (15% LOE remains)	In Progress	N	--
7	P	0	N (10% LOE remains)	In Progress	N	--
8	T	90	Y	--	Y	Residual Vadose Zone
9	B	80	Y	--	N	--
10	G	90	Y	--	N	--
11	R	90	Y	--	N	--
12	L	90	Y	--	N	--
13	K	0	N (75% LOE remains)	FFA Schedule	Unknown	Unknown
14	N	0	N (65% LOE remains)	FFA Schedule	Y	Fuel Oil, Diesel, Solvents

* 0% - Groundwater remedy not yet agreed upon
** Remedy not yet agreed upon; however, LOE to remediate expected low.

Conclusion

- **Much progress has been made in groundwater remediation at SRS**
  - **Contaminants have been addressed in 12 of 14 groundwater contamination areas:**
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